REMARKS/ARGUMENTS

Claims 1-21 are pending in this application. By this Amendment, Figs. 1-2 and claims 1, 4-7 and 10 are amended, and claim 3 is cancelled. Support for the amended claims can be found throughout the specification, including the original claims and the drawings. Withdrawal of the rejections in view of the above amendments and the following remarks is respectfully requested.

I. Objection to the Drawings

The Office Action objects to the drawings due to informalities. It is respectfully submitted that the amendments to Figures 1 and 2 submitted herewith are responsive to the Examiner's comments, and thus the objection should be withdrawn.

II. Rejection Under 35 U.S.C. §112, First Paragraph

The Office Action rejects claims 1-21 under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. Claim 3 has been cancelled. This rejection, in so far as it applies to the remaining claims, is respectfully traversed.

The present application is directed to a dishwasher having a semi-cylindrical rotatable valve 50 that is driven by a driver 60 to selectively control the flow of water through a supply pipe 22, an upper pipe 26 and a lower pipe 28. The driver 60 rotates the valve 50 so that its outer wall blocks one or more of the pipes 22, 26, 28 as appropriate for a particular point in the wash cycle (see paragraph 46 of the present application). The driver 60 includes a motor 62 that rotates the valve 50, a cam 64 that rotates coaxially with the valve 50, and a sensing unit 66 that

contacts an outer surface of the cam 64 to determine a corresponding position of the valve 50 and control operation of the motor 62 accordingly (see paragraphs 49-50).

The cam 64 includes a first portion 64a and a second portion 64b that has a smaller radius than that of the first portion 64a. The sensing unit 66 includes a switch 66a, a button 66b, and a lever 66c. As the cam 64 rotates, the end of the lever 66c contacts the outer surface of the cam 64. If the lever 66c is in contact with the larger radius first portion 64a of the cam 64, as shown in Figures 5A and 5B, the lever 66c is elastically bent and depresses the button 66b. If the lever 66c is in contact with the smaller radius second portion 64b of the cam 64, as shown in Figures 5C and 5D, the lever 66c does not apply pressure to the button 66b (see paragraphs 52-52 and 55-57).

Figures 5A-5D of the present application illustrate exemplary movement of the valve 50 to selectively control the distribution of water to the upper and lower pipes 26, 28. Figure 5A shows the valve 50 and cam 64 as they have been rotated clockwise by the motor 62. At the rotational position at which the outer wall of the valve 50 blocks the entrance to the lower pipe 28, the end of the lever 66c has just made the transition from the smaller radius second portion 64b of the cam 64 up to the larger radius first portion 64a of the cam 64. This transition causes the button 66b to be depressed by the lever 66c, thus causing activation of the switch 66a (see paragraph 60). Activation of the switch 66a at this particular point in the wash cycle causes power to the motor 62 to be cut off, thus leaving the valve 50 in place for a first predetermined amount of time as water flows in from the supply pipe 22 and into the upper pipe 26, while the

lower pipe 28 remains blocked. During this time, the button 66b remains depressed, the valve 50 stays in this position, power to the motor 62 remains off, and water is supplied to the upper pipe 26 until the first predetermined amount of time has elapsed and it is time to enter the next portion of the wash cycle (see paragraph 62).

After the first predetermined amount of time has elapsed, power is supplied to the motor 62 for a second predetermined amount of time, causing the motor 62 to turn the valve 50 and cam 64 clockwise, as shown in Figure 5B. As the end of the lever 66c remains on the larger radius second portion 64b of the cam 64, the button 66b remains depressed by the lever 66c (see paragraph 64). After the second predetermined amount of time has elapsed, power to the motor 62 is cut off to stop rotation of the valve 50 and the cam 64, so that the valve 50 blocks the supply pipe 22 (as well as the lower pipe 28), as shown in Figure 5B. Thus, in this portion of the wash cycle, clean wash water is not supplied to either of the upper or lower pipes 26, 28 (see paragraph 65) After a third predetermined amount of time has elapsed with the supply pipe 22 blocked, and it is time to enter the next portion of the wash cycle, power is again supplied to the motor 62 and the valve 50 and the cam 64 are again rotated as shown in Figure 5C.

The valve 50 and cam 64 continue to rotate, with the button 66b depressed by the lever 66c, until the outer wall of the valve 50 blocks only the entrance to the lower pipe 28. As the end of the lever 66c makes the transition from the larger radius first portion 64a of the cam 64 to the smaller radius second portion 64b of the cam 64, the lever 66c releases the button 66b (see paragraphs 68-70). Restoration of the button 66b causes power to be cut to the motor 62,

and the valve 50 and cam 64 to stop rotating, thus blocking the upper pipe 26 and allowing water to flow from the supply pipe 22 to the lower pipe 28, as shown in Figure 5C (see paragraph 71). The valve 50 and the cam 64 remain in this position until a fourth predetermined amount of time has elapsed and it is time to enter the next portion of the wash cycle.

After the fourth predetermined amount of time has elapsed, power is again supplied to the motor 62 to rotate the valve 50 and cam 64 to a full open position, in which the supply pipe 22 supplies water to both the upper and lower pipes 26, 28, as shown in Figure 5D. During this rotation, the end of the lever 66c remains in contact with the smaller radius second portion 64b of the cam 64, and the button 66b remains in the restored position (see paragraphs 73-74). Once the end of the lever 66c makes the transition from the smaller radius second portion 64b of the cam 64 to the larger radius first portion 64a of the cam 64, the lever 66c depresses the button 66b, power is cut to the motor 62, and the rotational cycle of the valve 50/cam returns to the position shown in Figure 5A, where the cycle may resume as necessary.

It is respectfully submitted that the operation of the valve, motor, cam and sensing unit, as described above, would be well understood by one of ordinary skill in the art given the detailed description provided by the drawings and specification. It is further submitted that the disclosure provided by the specification and drawings would be more than adequate for one of ordinary skill to make and use the system disclosed in the present application. For at least these reasons, it is respectfully submitted that claims 1-21 meet the requirements of 35 U.S.C. §112, first paragraph, and thus the rejection should be withdrawn.

The Office Action asserts that it is unclear how the sensor controls the motor, and what controls the sensor. As set forth above, the sensing unit 66 includes the switch 66a, the button 66b, and the lever 66c. At certain points during operation, contact between the cam 64 and the lever 66c either depresses or restores the button 66b. The corresponding signal provided by the switch 66a as the button is depressed or released is used to determine when to apply power to the motor, or remove power from the motor. At other times, as described above, a timer is used to determine when to apply power to the motor, or when to remove power from the motor (see specifically, paragraph 71 of the present application). Likewise, the rotational speed of the motor 62 (and thus the valve 50 and cam 64) may be controlled to adjust opening and closing periods for the pipes 22, 26, 28 (see paragraph 72). It is respectfully submitted that the specification as originally filed clearly sets forth how the sensing unit 66 and its various (structural) components interact with the cam 64 and valve 50 to control operation of the motor 62, and that such structure and operation would be well understood by one of ordinary skill in the art.

The Office Action also asserts that the disclosure does not discuss turning power to the motor 62 back on, nor does it discuss turning power to the motor 62 on initially in the wash cycle. As set forth above, the specification clearly sets forth numerous points during the exemplary cycle shown in Figures 5A-5D at which this is done. Further, it would be well understood by one of ordinary skill in the art that power would have to be supplied to the motor 62 at the beginning of a cycle if the motor 62 is expected to supply a rotational force that rotates

the valve 50 and the cam 63, as clearly set forth in the specification. It would also be well understood that power would be intermittently supplied to the motor 62 to rotate or stop the valve 50 and cam 64 based on a particular point in the wash cycle.

The Office Action questions the use of both a lever 66c/button 66b combination and a timer, and the reason for the length of the recessed second portion 64b of the cam 64 (versus just a small nick). As set forth above, power to the motor 62 may at certain points in the cycle be supplied based on contact between the lever 66c/button 66b and the outer surface of the cam 64 (i.e., while the valve 50 and cam 64 are rotating). At other points, power to the motor 62 may be controlled based on how long the valve 50 has been in a particular position (various predetermined times). This type of control scenario would be well understood by one of ordinary skill in the art based on the disclosure provided by the drawings and specification. As to the length of the second portion 64b of the cam 64, the travel time of the end of the lever 66c along the second portion 64b of the cam 64, and the transition points at the two opposite ends of this portion 64b, are used to identify a particular position of the valve 50 to the sensing unit 66. The assertion that a notch would suffice in this instance is immaterial as to whether or not the system as disclosed is enabled by the disclosure.

The Office Action questions how the cam 64 advances from the position in Figure 5B to the position in Figure 5C if the button 64b is no longer compressed. However, as set forth above, at this particular portion of the cycle, power is again supplied to the motor 62 after the

third predetermined amount of time has elapsed, and the button 66b remains compressed as the valve 50 moves from the position shown in Figure 5B to the position shown in Figure 5C.

For at least the reasons set forth above, it is respectfully submitted that claims 1, 2 and 4-21 meet the requirements of 35 U.S.C. §112, first paragraph, and thus the rejection should be withdrawn.

III. Rejection Under 35 U.S.C. §112, Second Paragraph

The Office Action rejects claims 1, 3-5, 7, 10, 12-14 and 18 under 35 U.S.C. §112, second paragraph, as allegedly indefinite. Claim 3 has been cancelled. This rejection, in so far as it applies to the remaining claims, is respectfully traversed.

The Office Action asserts that it is unclear as to how the claimed driver determines a first position of the valve and causes the valve to rotate to a second position based on the determined first position, as previously recited in independent claim 1. It is noted that this feature has been deleted from independent claim 1. The Office Action also asserts that it is unclear as to how the sensor contacts an outer surface of the cam so as to control operation of the motor, as previously recited in claim 3 (now cancelled). It is noted that the subject matter of claim 3 has been incorporated into independent claim 1.

As set forth above, the driver 60 relies on the physical interaction between the sensing unit 66 (specifically, the lever 66c) and the cam 64 to control the motor 62 and subsequent rotation of the valve 50. The sensing unit 66 determines a position of the valve 50 based on a point of contact between the end of the lever 66c and the outer surface of the cam 64 (i.e.,

against the first portion 64a, second portion 64b, or one of the transition steps therebetween). Based on the position of the end of the lever 64 against the outer surface of the cam 64, the sensing unit 66 can determine how the valve 50 (which rotates coaxially with the cam 64) is positioned, and rotate the valve 50 and cam 64 to the next position accordingly. Thus, the claimed driver rotates the valve 50 from a current position to its next position based on a contact location between the end of the lever 64 and the outer surface of the cam 64, and the requirements of a particular wash cycle.

Claims 5, 7, and 10 have been amended to provide clarification of the first and second cam sections, in response to the Examiner's comments.

With respect to claims 12-13, the Office Action asserts that the terms "upper" and "lower" are relative terms, and not given patentable weight. Applicant respectfully disagrees. It is noted that these terms are used in independent claim 1 to distinguish two different pipes to which the supply pipe selectively supplies water. Use of the terms "upper" and "lower" does not render the claims indefinite, but rather serves to further define the claimed structure. Note, the upper pipe carries water to the top nozzle, and the lower pipe carries water to a bottom nozzle. Whether or not the terms "upper" and 'lower" are afforded patentable weight by the Examiner is immaterial as to whether or not the use of these terms renders the claims indefinite.

With respect to independent claim 14, the Office Action asserts that it is unclear as to how a sensor contacts a cam coupled to the valve and determines a current position sensed by the sensor. This was discussed above with respect to independent claim 1. The Office Action

also asserts that the cam is contacted by the sensor the entire time. It is assumed that the Examiner is referring to the continuous contact between the end of the lever 66c and the outer surface of the cam 64. However, the continuous contact between the end of the lever 66c and the cam 64 results in either activating or deactivating the switch 66a as some predetermined amount of time elapses. As set forth above, and as would be well understood by one of ordinary skill in the art, the sensing unit 66 uses this positional information between the cam 64 and the lever 66c, as well as time information, to determine a current position of the valve 50, which rotates coaxially with the cam 64.

With respect to claim 18, the Office Action asserts that the term "current" is not understood. It is noted that "a current position of the valve" as recited in claim 18 simply refers to a position of the valve 50 at the particular time the button 66b is compressed by the lever 66c, and a position of the valve 50 at a particular time the button 66b is released by the lever 66c. Thus, in claim 18, the sensing unit 66 is making a determination of how/where the valve 50 is positioned at two different points during rotation of the valve 50, first when the button 66b is depressed, and then again when the button 66b is released.

For all of the above reasons, it is respectfully submitted that claims 1, 4, 5, 7, 10, 12-14 and 18 meet the requirements of 35 U.S.C. §112, second paragraph, and thus the rejection should be withdrawn.

IV. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned **Joanna K. Mason**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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